

WHAT IS CLAIMED IS:

1. A detergent composition comprising a primary surfactant system, a secondary surfactant system, and water,

wherein said primary surfactant system comprises at least one primary surfactant chosen from a linear alkyl benzene sulfonic acid, a linear alkyl benzene sulfonate, an α -olefin sulfonate, an alcohol ether sulfate, an alkyl sulfate, and alkali metal, alkaline earth metal, amine and ammonium salts thereof,

wherein said secondary surfactant system comprises at least one secondary surfactant chosen from an alkyl polyglycoside and an α -sulfomethyl ester, and

wherein the weight ratio of said at least one primary surfactant to said at least one secondary surfactant, based on the solids content of said detergent composition, is at least 3:1.

2. A composition according to claim 1, wherein said weight ratio of said at least one primary surfactant to said at least one secondary surfactant ranges from 3:1 to 6:1.

3. A composition according to claim 2, wherein said weight ratio of said at least one primary surfactant to said at least one secondary surfactant ranges from 3.5:1 to 5:1.

4. A composition according to claim 3, wherein said weight ratio of said at least one primary surfactant to said at least one secondary surfactant is 4:1.

5. A composition according to claim 1, wherein said primary surfactant system comprises at least one primary surfactant chosen from a linear C_{10} - C_{16} alkyl benzene sulfonic acid, a linear C_{10} - C_{16} alkyl benzene sulfonate, and an alkali metal, alkaline earth metal, amine and ammonium salt thereof.

6. A composition according to claim 5, wherein said at least one primary surfactant is chosen from dodecylbenzene sulfonic acid, dodecylbenzene sulfonate, decylbenzene sulfonate, undecylbenzene sulfonate, tridecylbenzene sulfonate, nonylbenzene sulfonate and alkali metal, alkaline earth metal, amine and ammonium salts thereof.

7. A composition according to claim 6, wherein said alkali metal, alkaline earth metal, amine and ammonium salts comprise at least one cation chosen from sodium, potassium, ammonium, mono-alkanolammonium, di-alkanolammonium, tri-alkanolammonium, and magnesium.

8. A composition according to claim 6, wherein said at least one primary surfactant is dodecylbenzene sulfonic acid, magnesium dodecylbenzene sulfonate, sodium dodecylbenzene sulfonate, triethanolammonium dodecylbenzene sulfonate,

magnesium/sodium dodecylbenzene sulfonate, or
magnesium/sodium/triethanolammonium dodecylbenzene sulfonate.

9. A composition according to claim 8, wherein the mole ratio of Mg:Na in said magnesium/sodium dodecylbenzene sulfonate ranges from 1:3 to 3:1.

10. A composition according to claim 9, wherein the mole ratio of Mg:Na in said magnesium/sodium dodecylbenzene sulfonate is 1:1.

11. A composition according to claim 8, wherein the mole ratio of Mg:Na in said magnesium/sodium/triethanolammonium dodecylbenzene sulfonate ranges from 1:3 to 3:1, and the mole ratio of $(\text{HOCH}_2\text{CH}_2)_3\text{NH}:\text{Na}$ in said magnesium/sodium/triethanolammonium dodecylbenzene sulfonate ranges from 0.1:1 to 1:1.

12. A composition according to claim 8, wherein the mole ratio of Mg:Na: $(\text{HOCH}_2\text{CH}_2)_3\text{NH}$ in said magnesium/sodium/triethanolammonium dodecylbenzene sulfonate ranges from 1:1:0.5 to 1:1:1.

13. A composition according to claim 1, wherein said primary surfactant system comprises at least one primary surfactant chosen from an α -olefin sulfonate, an alcohol ether sulfate, an alkyl sulfate, and alkali metal, alkaline earth metal, amine and ammonium salts thereof.

14. A composition according to claim 13, wherein said alkali metal, alkaline earth metal, amine and ammonium salts comprise at least one cation chosen from sodium, potassium, ammonium, mono-alkanolammonium, di-alkanolammonium, tri-alkanolammonium, and magnesium.

15. A composition according to claim 13, wherein said α -olefin sulfonate or alkali metal, alkaline earth metal, amine and ammonium salt thereof is a C_{14} - C_{16} α -olefin sulfonate.

16. A composition according to claim 15, wherein said C_{14} - C_{16} α -olefin sulfonate or alkali metal, alkaline earth metal, amine and ammonium salt thereof is sodium C_{14} - C_{16} α -olefin sulfonate.

17. A composition according to claim 16, wherein said sodium C_{14} - C_{16} α -olefin sulfonate is in powdered or liquid form.

18. A composition according to claim 13, wherein said alcohol ether sulfate or alkali metal, alkaline earth metal, amine and ammonium salt thereof has 1 to 4 moles of ethoxylation.

19. A composition according to claim 18, wherein said alcohol ether sulfate or alkali metal, alkaline earth metal, amine and ammonium salt thereof has 1 mole of ethoxy

20. A composition according to claim 18, wherein said alcohol ether sulfate or alkali metal, alkaline earth metal, amine and ammonium salt thereof has 2 moles of ethoxylation.

21. A composition according to claim 18, wherein said alcohol ether sulfate or alkali metal, alkaline earth metal, amine and ammonium salt thereof has 3 moles of ethoxylation.

22. A composition according to claim 18, wherein said alcohol ether sulfate or alkali metal, alkaline earth metal, amine and ammonium salt thereof is chosen from ammonium laureth-1-sulfate, ammonium laureth-2-sulfate, ammonium laureth-3-sulfate, ammonium myreth-3-sulfate, sodium laureth-1-sulfate, sodium laureth-2-sulfate, sodium laureth-3-sulfate and sodium myreth-3-sulfate.

23. A composition according to claim 13, wherein said alkyl sulfate or alkali metal, alkaline earth metal, amine and ammonium salt thereof is chosen from sodium lauryl sulfate, magnesium lauryl sulfate, ammonium lauryl sulfate and triethanolammonium lauryl sulfate.

24. A composition according to claim 1, wherein said primary surfactant system comprises:

a) at least one linear C₁₀-C₁₆ alkyl benzene sulfonic acid, linear C₁₀-C₁₆ alkyl benzene sulfonate or alkali metal, alkaline earth metal, amine and ammonium salt thereof; and

b) at least one additional primary surfactant chosen from an α -olefin sulfonate, an alcohol ether sulfate, an alkyl sulfate, and alkali metal, alkaline earth metal, amine and ammonium salts thereof.

25. A composition according to claim 24, wherein

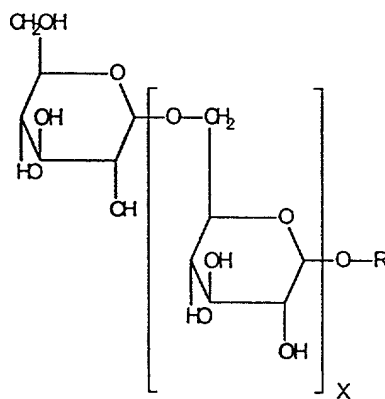
a) said at least one linear C₁₀-C₁₆ alkyl benzene sulfonic acid, linear C₁₀-C₁₆ alkyl benzene sulfonate or alkali metal, alkaline earth metal, amine and ammonium salts thereof is chosen from dodecylbenzene sulfonic acid, magnesium dodecylbenzene sulfonate, sodium dodecylbenzene sulfonate, magnesium/sodium dodecylbenzene sulfonate and magnesium/sodium/triethanolamine dodecylbenzene sulfonate; and

b) said at least one additional primary surfactant is chosen from an alcohol ether sulfate and an alkali metal, alkaline earth metal, amine and ammonium salt thereof having 1 to 4 moles of ethoxylation.

26. A composition according to claim 25, wherein said at least one additional primary surfactant is present in an amount ranging from 5 to 30% by weight, based on the weight of said composition.

27. A composition according to claim 1, wherein said secondary surfactant system comprises at least one secondary surfactant chosen from a C_8 to C_{16} alkyl polyglycoside.

28. A composition according to claim 27, wherein said C_8 to C_{16} alkyl polyglycoside has the following chemical structure:

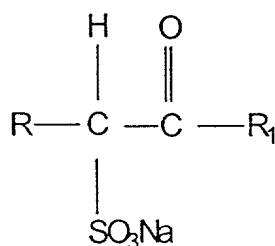


wherein R is an alkyl group having 8 to 16 carbon atoms, and x ranges from 0 to 3.

29. A composition according to claim 28, wherein said C₈ to C₁₆ alkyl polyglycoside is chosen from a C₈-C₁₀ alkyl polyglycoside with a degree of polymerization of 1.5, a C₈-C₁₀ alkyl polyglycoside with a degree of polymerization of 1.6, a C₈-C₁₀ alkyl polyglycoside with a degree of polymerization of 1.7, a C₈-C₁₆ alkyl polyglycoside with a degree of polymerization of 1.45, a C₁₂-C₁₆ alkyl polyglycoside with a degree of polymerization of 1.4, a C₈-C₁₄ alkyl polyglycoside with a degree of polymerization of 1.4, a C₈-C₁₄ alkyl polyglycoside with a degree of polymerization of 1.5, a C₁₂-C₁₄ alkyl polyglycoside with a degree of polymerization of 1.4, and a C₁₂-C₁₆ alkyl polyglycoside with a degree of polymerization of 1.6.

30. A composition according to claim 1, wherein said secondary surfactant system comprises at least one secondary surfactant chosen from an α -sulfomethyl ester.

31. A composition according to claim 30, wherein said an α -sulfomethyl ester has the following chemical structure:



wherein R is an alkyl group having 10 to 16 carbon atoms, and R₁ is chosen from a methyl group and a sodium atom.

32. A composition according to claim 30, wherein said at least one secondary surfactant is chosen from a C₁₂-C₁₈ sodium methyl α-sulfomethyl ester and a C₁₂-C₁₈ disodium α-sulfo fatty acid salt.

33. A composition according to claim 1, wherein said primary surfactant system is present in an amount ranging from 5 to 40% by weight, based on the weight of said composition.

34. A composition according to claim 33, wherein said primary surfactant system is present in an amount ranging from 8 to 35% by weight, based on the weight of said composition.

35. A composition according to claim 34, wherein said primary surfactant system is present in an amount ranging from 10 to 30% by weight, based on the weight of said composition.

36. A composition according to claim 1, wherein said secondary surfactant system is present in an amount ranging from 2 to 30% by weight, based on the weight of said composition.

37. A composition according to claim 36, wherein said secondary surfactant system is present in an amount ranging from 4 to 25% by weight, based on the weight of said composition.

38. A composition according to claim 37, wherein said secondary surfactant system is present in an amount ranging from 5 to 20% by weight, based on the weight of said composition.

39. A composition according to claim 1 further comprising at least one alkanolamide.

40. A composition according to claim 39, wherein said at least one alkanolamide is a lower alkanolamide of a higher alkanoic acid.

41. A composition according to claim 40, wherein said at least one alkanolamide is a mono-alkanolamide chosen from lauryl/myristic monoethanolamide and coco monoethanolamide.

42. A composition according to claim 39, wherein said at least one alkanolamide is present in an amount ranging from 0.5 to 10% by weight, based on the weight of said composition.

43. A composition according to claim 1 further comprising at least one amphoteric surfactant.

44. A composition according to claim 43, wherein said at least one amphoteric surfactant is chosen from cocoamidopropyl betaine, sodium cocoamphoacetate, sodium lauroamphoacetate and sodium cocoamphodiacetate.

45. A composition according to claim 43, wherein said at least one amphoteric surfactant is present in an amount ranging from 0.5 to 10% by weight, based on the weight of said composition.

46. A composition according to claim 1 further comprising at least one antibacterial agent.

47. A composition according to claim 46, wherein said at least one antibacterial agent is chosen from 2,4,4'-trichloro-2'-hydroxydiphenyl ether and 4-chloro-3,5-dimethyl phenol.

48. A composition according to claim 47, wherein said at least one antibacterial agent is present in an amount ranging from 0.1 to 10% by weight, based on the weight of said composition.

49. A composition according to claim 1 further comprising at least one additive chosen from an additional secondary surfactant other than said alkyl polyglycoside and said α -sulfomethyl ester, a hydrotrope, a preservative, a perfume, a thickener, and a dye.

50. A detergent composition comprising a primary surfactant system, a secondary surfactant system, and water,

wherein said primary surfactant system comprises a) at least one linear C_{10} - C_{16} alkyl benzene sulfonic acid or alkali metal, alkaline earth metal, amine and ammonium salt thereof chosen from dodecylbenzene sulfonic acid, magnesium dodecylbenzene sulfonate, sodium dodecylbenzene sulfonate, triethanolammonium dodecylbenzene sulfonate, magnesium/sodium dodecylbenzene sulfonate, and magnesium/sodium/triethanol ammonium dodecylbenzene sulfonate, and b) at least one alcohol ether sulfate having 1 to 4 moles of ethoxylation;

wherein said secondary surfactant system comprises at least one C_8 to C_{16} alkyl polyglycoside with a degree of polymerization ranging from 1 to 3, and

wherein the weight ratio of said at least one linear C_{10} - C_{16} alkyl benzene sulfonic acid or alkali metal, alkaline earth metal, amine and ammonium salt thereof to said at least one C_8 to C_{16} alkyl polyglycoside, based on the solids content of said detergent composition, ranges from 3:1 to 5:1.

51. A composition according to claim 50, wherein said weight ratio of said at least one linear C₁₀-C₁₆ alkyl benzene sulfonic acid or salt thereof to said at least one C₈ to C₁₆ alkyl polyglycoside ranges from 3.5:1 to 5:1.

52. A detergent composition comprising a primary surfactant system, a secondary surfactant system, and water,

wherein said primary surfactant system comprises at least one primary surfactant chosen from a linear alkyl benzene sulfonic acid, a linear alkyl benzene sulfonate, an α -olefin sulfonate, an alcohol ether sulfate, an alkyl sulfate, and alkali metal, alkaline earth metal, amine and ammonium salts thereof,

wherein said secondary surfactant system comprises at least one α -sulfomethyl ester, and

wherein the weight ratio of said at least one linear C₁₀-C₁₆ alkyl benzene sulfonic acid or alkali metal, alkaline earth metal, amine and ammonium salt thereof to said at least one α -sulfomethyl ester, based on the solids content of said detergent composition, is at least 2.7:1.

53. A composition according to claim 52, wherein said primary surfactant system comprises a) at least one linear C₁₀-C₁₆ alkyl benzene sulfonic acid or alkali metal, alkaline earth metal, amine and ammonium salt thereof chosen from dodecylbenzene sulfonic acid, magnesium dodecylbenzene sulfonate, sodium dodecylbenzene sulfonate, triethanolammonium dodecylbenzene sulfonate,

magnesium/sodium dodecylbenzene sulfonate, and magnesium/sodium/triethanolammonium dodecylbenzene sulfonate, and b) at least one alcohol ether sulfate having 1 to 4 moles of ethoxylation.

54. A composition according to claim 52, wherein said weight ratio of said at least one linear C_{10} - C_{16} alkyl benzene sulfonic acid or alkali metal, alkaline earth metal, amine and ammonium salt thereof to said at least one α -sulfomethyl ester ranges from 3:1 to 6:1.

55. A composition according to claim 54, wherein said weight ratio of said at least one linear C_{10} - C_{16} alkyl benzene sulfonic acid or alkali metal, alkaline earth metal, amine and ammonium salt thereof to said at least one α -sulfomethyl ester ranges from 3.25:1 to 5:1.

56. A method for cleaning soiled dishware, pots and/or pans, said method comprising contacting said soiled dishware, pots and/or pans with a detergent composition comprising a primary surfactant system, a secondary surfactant system, and water, and removing the soil from said dishware,

wherein said primary surfactant system comprises at least one primary surfactant chosen from a linear alkyl benzene sulfonic acid, a linear alkyl benzene sulfonate, an α -olefin sulfonate, an alcohol ether sulfate, an alkyl sulfate, and alkali metal, alkaline earth metal, amine and ammonium salts thereof,

wherein said secondary surfactant system comprises at least one secondary surfactant chosen from an alkyl polyglycoside and an α -sulfomethyl ester, and

wherein the weight ratio of said at least one primary surfactant to said at least one secondary surfactant, based on the solids content of said detergent composition, is at least 3:1.

200004260